

What is claimed is:

1. A speech synthesis device comprising:  
 speech database storing means for storing a speech database created  
 by way of dividing the sample speech waveform data obtained from recording  
 5 human speech utterances into speech units, and associating the sample  
 waveform data in each speech unit with their corresponding phonetic  
 information;

speech waveform composing means for dividing phonetic information  
 into speech units upon receiving the phonetic information of speech sound to  
 10 be synthesized, for obtaining sample speech waveform data from the speech  
 database corresponding to the phonetic information in a speech unit, and for  
 generating speech waveform data to be composed by means of concatenating  
 the sample speech waveform data in the speech unit; and

analog converting means for converting the speech waveform data  
 15 received from the speech waveform composing means into analog signals;

wherein the speech database storing means divides the sample speech  
 waveform data into the speech units of Extended CV, which is a contiguous  
 sequence of phonemes without clear distinction containing a vowel or some  
 vowels;

20 and wherein the speech waveform composing means divides the  
 phonetic information into speech units of Extended CV.

2. A computer-readable storing medium for storing a program for  
 executing speech synthesis by means of a computer using a speech database  
 25 constructed with sample speech waveform data associated with its  
 corresponding phonetic information, the program comprising the steps of:

dividing phonetic information into Extended CVs upon receiving the  
 phonetic information of speech sound to be synthesized;

obtaining sample speech waveform data corresponding to the divided  
 30 phonetic information in Extended CV from the speech database; and  
 generating speech waveform data to be composed by means of

concatenating the sample speech waveform data in Extended CV;

wherein the Extended CV refers to a contiguous sequence of phonemes without clear distinction containing at least one vowel.

5           3. A speech synthesis device comprising:

dividing means for dividing the phonetic information into Extended CVs upon receiving the phonetic information of speech sound to be synthesized;

10           speech waveform composing means for generating speech waveform data in a unit of Extended CV divided with the dividing means, and for obtaining speech waveform data to be composed by means of concatenating the speech waveform data in a unit of each Extended CV; and

15           analog converting means for converting the speech waveform data provided from the speech waveform composing means into analog signals of speech sound;

wherein the Extended CV refers to a contiguous sequence of phonemes without clear distinction containing at least one vowel.

20           4. A computer-readable storing medium for storing a program for executing speech synthesis using a computer, the program comprising the steps of:

dividing phonetic information into Extended CVs upon receiving the phonetic information of speech sound to be synthesized;

25           generating speech waveform data in a unit of Extended CV; and

obtaining speech waveform data to be composed by means of concatenating the speech waveform data in a unit of each Extended CV;

wherein the Extended CV refers to a contiguous sequence of phonemes without clear distinction containing at least one vowel.

30           5. A computer-readable storing medium for storing a program for executing dividing process using a computer, the program comprising the step

of:

dividing phonetic information into Extended CVs defined as follows,  
upon receiving the phonetic information;

wherein the Extended CV refers to a contiguous sequence of phonemes  
5 without clear distinction containing at least one vowel.

6. A computer-readable storing medium for storing a speech database,  
the database comprising:

a waveform data area that stores sample speech waveform data  
10 divided into Extended CV; and

a phonetic information area that stores the phonetic information  
associated with sample speech waveform data in a unit of each Extended CV;

wherein the Extended CV refers to a contiguous sequence of phonemes  
without clear distinction containing at least one vowel.

15 7. A computer-readable storing medium for storing phonetic  
information data to be used for speech processing;  
wherein the phonetic information data is characterized by being  
handled in a unit of Extended CV provided with division information per  
20 Extended CV;

and wherein the Extended CV refers to a contiguous sequence of  
phonemes without clear distinction containing at least one vowel.

25 8. A computer-readable storing medium for storing a phoneme  
dictionary to be used for speech processing,  
wherein the phoneme dictionary contains a contour of vocal tract  
transmission function of each phoneme associated with phonetic information  
in a unit of Extended CV;

30 and wherein the Extended CV refers to a contiguous sequence of  
phonemes without clear distinction containing at least one vowel.

9. The speech synthesis device of claim 1, wherein the Extended CV is a sequence of phonemes containing, as a vowel element, one of a vowel, a combination of a vowel and a latter part of a long vowel, and a combination of a vowel and a second element of a diphthong,

5 and wherein a longer sequence shall be first selected as Extended CV.

10. The speech synthesis device of claim 1, wherein the Extended CV contains at least one of a consonant C excluding a geminated sound (Japanese SOKUON), a semi vowel, and a syllabic nasal, a semi vowel y, a vowel V excluding a latter part of a long vowel and a second element of a diphthong, a latter part of a long vowel R, the second element of a diphthong J, a geminated sound Q, and a syllabic nasal N,

15 and wherein the phoneme sequence with heavier syllable weight is selected first as the Extended CV, assuming the syllable weight of C and y to be "0", and a syllable weight of V, R, J, Q and N to be "1".

11. The speech synthesis device of claim 1, wherein the Extended CV includes at least a heavy syllable with a syllable weight of "2" selected from a group consisting of (C)(y) VR, (C)(y) VJ, (C)(y) VN and (C)(y) VQ and a light syllable with the syllable weight of "1" as defined by (C)(y) V,

20 and wherein the heavy syllable is given a higher priority than the light syllable for being selected as Extended CV,

and wherein (C) denotes that C or some Cs are attached to V,

25 and wherein (y) denotes whether y or ys are attached to V.

12. The speech synthesis device of claim 11, wherein the Extended CV further includes a superheavy syllable with a syllable weight of "3" such as (C)(y) VRN, (C)(y) VRQ, (C)(y) VJN, (C)(y) VJQ and (C)(y) VNQ,

30 and wherein the heavy syllable is given a higher priority than the light syllable and the superheavy syllable takes precedence over the heavy syllable for being selected as Extended CV.

13. The speech synthesis device of claim 1, wherein the speech database is constructed such that Extended CV can be searched for in order of decreasing length of a kana character string representing the reading of the Extended CV.

14. A speech processing method comprising the step of:  
treating a contiguous sequence of phonemes without clear distinction containing at least one vowel as Extended CV that is a unit which can not be split any more.

15. The speech synthesis device of claim 3, wherein the Extended CV is a sequence of phonemes containing, as a vowel element, one of a vowel, a combination of a vowel and a latter part of a long vowel, or a combination of a vowel and a second element of a diphthong.

and wherein the longer sequence shall be first selected as Extended CV.

16. The storing medium of claim 2, wherein the Extended CV is a sequence of phonemes containing, as a vowel element, one of a vowel, a combination of a vowel and a latter part of a long vowel, or a combination of a vowel and a second element of a diphthong,

and wherein the longer sequence shall be first selected as Extended CV.

17. The speech synthesis device of claim 3, wherein the Extended CV contains at least a consonant C excluding a geminated sound (Japanese SOKUON), a semi vowel and a syllabic nasal, a semi vowel y, a vowel V excluding a latter part of a long vowel and a second element of a diphthong, a latter part of a long vowel R, a second element of a diphthong J, a geminated sound Q, and a syllabic nasal N,

and wherein the phoneme sequence with heavier syllable weight is selected first as Extended CV assuming the syllable weight of C and y to be "0", and a syllable weight of V, R, J, Q and N to be "1".

5           18. The storing medium of claim 2, wherein the Extended CV contains at least one of a consonant C excluding a geminated sound (Japanese SOKUON), a semi vowel and a syllabic nasal, a semi vowel y, a vowel V excluding a latter part of a long vowel and a second element of a diphthong, a latter part of a long vowel R, a second element of a diphthong J, a geminated  
10 sound Q and a syllabic nasal N,

and wherein the phoneme sequence with heavier syllable weight is selected first as Extended CV, assuming the syllable weight of C and y to be "0", and a syllable weight of V, R, J, Q and N to be "1".

15           19. The speech synthesis device of claim 3, wherein the Extended CV includes at least a heavy syllable with a syllable weight of "2" such as (C)(y) VR, (C)(y) VJ, (C)(y) VN and (C)(y) VQ and a light syllable with the syllable weight of "1" determined by (C)(y) V,

and wherein the heavy syllable is given a higher priority than the  
20 light syllable for being selected as Extended CV,

and wherein (X) denotes that X or some Xs may or may not be attached to V.

25           20. The storing medium of claim 2, wherein the Extended CV includes at least a heavy syllable with the syllable weight of "2" selected from the group consisting of (C)(y) VR, (C)(y) VJ, (C)(y) VN and (C)(y) VQ and a light syllable with the syllable weight of "1" as determined by (C)(y) V,

and wherein the heavy syllable is given a higher priority than the light syllable for being selected as Extended CV,

30           and wherein (C) denotes whether C or some Cs are attached to V,

and wherein (y) denotes whether y or some ys are attached to V.

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be seen  
entirely~~

CV.

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